Use BuildAR to Help the Alzheimer's disease Patients

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Abstract—This paper seeks to help the Alzheimer's disease patients remember their beautiful memories by using BuildAR Software. The software will show the patients a picture and the picture will explain to the patients when and where the picture was taken. In addition, the software will allow the patients to explore related multimedia components, such as videos, pictures, and voice. This will help the Alzheimer's disease patients remember by entering into a spirit of happiness and joy, which may consequently help them heal.

Keywords—Augmented Reality; BuildAR; The Alzheimer's disease; Information Technology;

I. INTRODUCTION

The global demographic changes are seen to double or even triple the number of people who are over 65 years old in many countries by the middle of the century. This means chronic conditions and age-related illnesses and injuries become more prevalent, thus putting health care systems and entire economies at risk [1].

According to León [2], there are over 26 million people worldwide who are suffering from Alzheimer’s disease, and it is forecasted that by 2050, the number will quadruple. In the United States, for instance, there is an increase of the number of elders. As a result, around 14 million people may have Alzheimer’s disease (AD) in the coming few decades [3]. As such, majority of the people who live in the United States will know someone who is suffering from the disease over the course of their lifetime.

In a recent U.S. study, it is estimated that the number of Alzheimer’s disease patients in the country will reach 16 million by 2050. At present, more than 5 million people in the U.S. suffer from the disease. The new estimate, however, is significantly lower, showing only 3.1 million North American cases at present and 8.8 million by 2050.

Meanwhile, these are the estimates for other regions:

- Africa, 1.3 million at present and 6.3 million by 2050.
- Europe, 7.2 million at present and 16.5 million by 2050
- Latin America and the Caribbean, 2 million at present and 10.8 million by 2050
- Oceania, 20,000 at present and 800,000 by 2050.

How is Alzheimer’s disease defined? A disease of the brain, Alzheimer’s disease (AHLZ-high-merz) causes problems with memory, thinking, and behavior. It is not a normal part of aging [4].

Alzheimer’s gets worse over time. It can have wide variety of symptoms, but the problem that many people usually notice first is forgetfulness, which is serious enough so as to negatively affect their ability to function at home or at work, or to enjoy lifelong hobbies [5]. Another effect of the disease is that a person may become confused, get lost even in familiar places, misplace things, or experience problems with language. Moreover, a study by the Alzheimer’s Association showed that almost 50 percent of
caregivers agreed that care giving is causing problems in their immediate families. Furthermore, negative emotional reactions can result to a faster decline of an Alzheimer’s patient.

This study aims to use new technology to help those people who are suffering from this Alzheimer’s. Moreover, this software will try to reduce injury caused by the disease.

II. INFORMATION TECHNOLOGY

The most common and well-known of Alzheimer's disease is forgetfulness.

Forgetfulness is the most common and well-known symptom for AD. Other symptoms of AD include loss of cognitive abilities, thinking, judgment, and disorientation to place and time [6].

Many people with AD stay physically able-bodied while they slowly lose their memory and cognitive ability; hence, monitoring their behavior and activity is crucially important. Moreover, most of the research on AD is focused on the medication or the caregivers. There is not enough research available that focus on the use of technology for people who are suffering from AD [7].

While Information technology (IT) is designed to perform complex cognitive tasks, such as decision support, in various situations, it is also used for entertainment. Furthermore, it can be used to help people with cognitive disabilities and to improve quality of life [3].

IT can be used to provide help to people with AD and their caregivers [8]. There is a wide range of software that can be used to aid people with AD. Large numbers of people have acquired direct access to an increasingly wide variety of information and services, which is brought about by the increasing power of computers and the recent growth of information technologies.

The advancement in IT brings another option with regard to AD available, and that is the use of technology to ease the burden of the caregivers. Before the concept of IT is further discussed, it is important to define this term for the purpose of this paper.

Majority of the information technologies used to improve care for those who have AD can be divided into three main categories. These categories are [3]: (a) Information Technology for persons with AD (b) Information technology for the caregivers of AD, and (c) Information technology for healthcare professionals.

With regard to the various applications of information technology for people suffering from AD, classification by the three main stages of disease is possible. These are:

- Information Technology for the early stages.
- Information Technology for the mild to moderate stages.
- Information Technology for the moderate to moderately severe stages.

**Information Technology for the early stages:** Mood swings, lack in energy, and memory problems are primarily the symptoms of the early stage of AD. At this stage, a person can still manage to live independently and usually the assistance needed is on remembering certain tasks. The use of cognitive prosthetics is helpful to make a person remember those tasks. There is a wide variety of devices available that can be used as cognitive prosthetic for the patient to monitor the movement of the patient, thus helping the caregiver at the same time. According to a research conducted by Cole and Dehdashti [9], a technology was used to aid a person remember the tasks during the early stage of AD.

**Information Technology for the mild to moderate stages:** As a result of misdiagnoses being common at earlier stages, most of the people who have AD usually belong to mild to moderate disease progression category. This stage requires more care giving for the patients. The care giving needed could range anywhere from making sure that the patient is taking a lot of fluids to making sure that the patient is not wandering, depending on different patients. As the patient needs more active care giving at this stage, it is common for patients to move-in with a caregiver. The patients may have to relocate, which puts them in a less familiar environment. This can result to increased depression and feelings of alienation, and can consequently lead to a faster decline in the health of the patient.

**Information technology for the moderate to moderately severe stages:** AD patients at this stage usually experience increased behavioural disturbances, hence, they need more care giving. During the moderate to late stages of the disease, motes can be reprogrammed so that the caregiver will be informed of all the conditions of the patient. To monitor weight loss, sensors can be put in the patient’s bed. A combination of sensors put in chairs and infrared tags detected by cameras can also warn or tell the caregiver that the patient has fallen down or is sitting in the chair [10].
The use of technology to help people suffering from AD gives hope that they can live independently for longer periods of time. This paper will use the first classification to help AD patients remember nice memories.

III. TECHNOLOGY BUILDAR

There are different ways that people suffering from AD may benefit from modern technologies, ranging from multimedia that aids in identity retention to interactive body and mind exercises that aid in cognitive rehabilitation.

Augmented Reality (AR) [11] is a technology that makes way for virtual images to be flawlessly incorporated with the real world. AR applications used to need high end PCs and specialized equipment such as fast cameras and head mounted displays, however, recently the first AR applications have appeared on [12] and mobile phones [13]. In other words, Augmented Reality (AR) refers to computer displays that add virtual information to the sensory perception of the user. Most of the research on AR is geared toward “see-through” devices, which are usually worn on the head that overlay graphics and text on the view of the user of his or her surroundings. [14].

IT can play a crucial role in improving the condition of people suffering from AD. IT can give a caregiver information and support, and it can engage the patient in various activities to reduce the stress experienced by the caregiver.

One of the applications of this type of BuildAR is a tool for making augmented reality scenes. This technology combines graphics with the real world. As opposed to Virtual Reality or VR, which shows entirely computer generated environments, the objective of AR is to integrate virtual and real elements flawlessly.

One of the applications of this type is BuildAR is a tool for creating augmented reality scenes. It is a technology that merges computer graphics with the real world. In contrast with Virtual Reality, or VR, which presents entirely computer generated environments, AR aims to integrate virtual and real elements seamlessly.
Figure 2 illustrates the process involved in BuildAR. The system will compare the picture and the images in the database, and the results will display all the multimedia that are related to the picture. Thus, the patient does not need always need to be with his or her relatives to remind him or her of beautiful memories.

Mentally stimulating activities like reading the newspaper and playing computer games keep the brain sharp and are associated with a reduced risk of Alzheimer's disease.

Together with increased number of AD patients is an increased number in the population’s use of computer technologies. Using computer helps reduce the number of AD patients as well as expenses related to AD [15]. In addition, many countries use IT to help the AD patients, such as Fairfield, Australia, Hong Kong, and China [16][17][18].

No cure has been found for AD. A mix of medication, IT, and a positive approach to AD patients can help them live a better life, though. With the stresses that come with care giving for AD patients, it is natural for a caregiver to undergo stress. The proper use of technology can help the patient to be more independent, thus reducing the stress experienced by the caregiver. In addition, this can increase the confidence of the patient and decrease caregivers' financial burden.

The application has been presented to a group of doctors, the importance of this application has been stressed, and this can be an important tool to reduce the efforts and stresses associated with care giving for AD patients.

IV. CONCLUSION

IT can have a vital role in the life of a person suffering from AD. Using IT for AD patients can be a tool to extend their living independently. Besides that, its use can also enhance the level of confidence of a person with AD, which can result in the slow progression of the disease. Moreover, IT can be a tool to reduce stress experienced by caregivers during the later stages of AD. Researchers should come up with and develop different software applications to maintain the activities of day-to-day living. Thus, the researchers seek to design applications to help people with AD using Smartmobile as there is a lack of studies that focus on using mobile phones to help solve problems faced by AD patients.

REFERENCES


